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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,965	12/02/2003	Kenji Asakura	10873.1349US01	4361

23552 7590 02/16/2005

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EXAMINER	
PRUCHNIC, STANLEY J	

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 02/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/726,965	ASAKURA ET AL.	
	Examiner	Art Unit	
	Stanley J. Pruchnic, Jr.	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 16* is/are rejected.

7)☒ Claim(s) *15 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Response to Arguments

2. Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-5 and 16 are FINALLY rejected under 35 U.S.C. 103(a) as being unpatentable over **MACHLER** (U. S. Pat. No. 2,837,917 A) in view of U. S. Pat. No. 4,722,612 A, (**JUNKERT** *et al.*, hereinafter **JUNKERT**).

MACHLER discloses or suggests a temperature determining device (Fig. 4) as claimed by Applicant in **Claim 1,** comprising:

a temperature detecting unit (48) that detects a surface temperature of a determination object member (work 10) based on an intensity of infrared rays from the object member,

a unit (47) for determining a temperature for correction that determines a temperature (Col. 6, Lines 23-57) of an opposing member (black-body illuminator 49) opposed to the object member; and

a calculating unit that corrects the detected temperature obtained by the temperature detecting unit 48 using the temperature for correction obtained by the unit (47) for determining a temperature for correction.

MACHLER does not explicitly disclose a calculating unit as claimed by Applicant, but instead MACHLER discloses the pyrometer 47 may be utilized directly to determine the temperature of the illuminator after establishing equality between the temperatures of intensities of radiation emitted to the two pyrometers by adjusting the heating of the black-body illuminator (or heater strip) 49 (Col. 6, Lines 35-49). Furthermore, although MACHLER does disclose (Col. 4, Lines 66-69) that both radiation pyrometers should be substantially free from the effect of ambient temperature, since they may not be subject to exactly the same ambient temperature conditions, **MACHLER** does not explicitly disclose correcting the detected temperature obtained by the temperature detecting unit (pyrometer 48) using an environmental temperature around the temperature detecting unit and said temperature for correction as claimed by Applicant in Claim 1.

JUNKERT discloses a temperature determining device including a calculating unit (processor shown in Fig. 2) for processing the signals in order to compensate for an

environmental (ambient) temperature around the temperature detecting unit (first thermopile device TP1; Col. 4, Lines 6-28). **JUNKERT** discloses an environmental temperature is detected by a transducer or a second thermopile TP2 (Col. 6, Lines 36-46).

JUNKERT is evidence that ordinary workers in the field of temperature measurement would have recognized the benefit of compensating for the ambient environmental temperature around the temperature detecting unit using a transducer or second thermopile in order to minimize errors associated with rapid ambient temperature changes (*e.g.*, see the Abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a calculating unit and another transducer or a second thermopile for compensating for the ambient environmental temperature around the temperature detecting unit with the device of **MACHLER** in order to minimize errors associated with rapid ambient temperature changes as taught by **JUNKERT**.

Further regarding **Claims 2 and 16**: **MACHLER** discloses the temperature detecting unit includes a thermopile (48) that outputs a voltage (to galvanometer G) corresponding to a temperature difference between a hot junction and a cold junction, while ***MACHLER in view of JUNKERT*** teaches that the unit for determining a temperature for correction (which is the calculating unit, *i.e.*, the processor shown in Fig. 2) determines a temperature of the cold junction of the thermopile as described above regarding Claim 1.

Further regarding **Claim 3**: **MACHLER** discloses the calculating unit corrects the detected temperature using a first temperature for correction (a calibration first operating point, e.g. 55 degrees C) determined by the unit for determining a temperature for correction at a predetermined point in time (time of calibration) before a point in time when the temperature detecting unit detects a temperature and a second temperature (the temperature of the heat sink) for correction determined by the unit for determining a temperature for correction at the point in time when the temperature detecting unit detects the temperature.

Further regarding **Claim 4**: **MACHLER** discloses or suggests the first temperature for correction is determined when heating of the object member is started (Col. 2, Lines 6-12).

Regarding **Claim 5: MACHLER** discloses or suggests a temperature correcting method as claimed by Applicant in **Claim 5**, comprising (referring to the embodiment of Fig. 1):

a first step of detecting a temperature (Col. 3, Lines 29-39) of a determination object member (work 10) based on an intensity of infrared rays (using pyrometer 24 in its second position, II) from the object member 10;

a second step of determining a temperature (Col. 3, Lines 56-70) of an opposing member (black-body illuminator 25) opposed to the object member (using pyrometer 24 in its first position, I);

a fourth step of further correcting (Col. 3, Lines 50-52) the detected temperature based on a function of the temperature for correction obtained in the second step. The fourth step is accomplished by MACHLER when he changes (corrects) the temperature

of the opposing member iteratively until the pyrometer reads the same voltage output in each position. MACHLER discloses that when that condition is realized, the determined temperature of the opposing member is the same temperature of the determination object member (work 10).

MACHLER does not explicitly disclose the third step of correcting the detected temperature obtained in the first step using an environmental temperature around a temperature detecting unit that detects said temperature of the object member as claimed by Applicant in Claim 5.

JUNKERT discloses a temperature determining method including a step of detecting an environmental temperature around a temperature detecting unit that detects said temperature of the object member by using a transducer or a second thermopile TP2 (Col. 6, Lines 36-46) in order to compensate for the environmental (ambient) temperature around the temperature detecting unit (first thermopile device TP1; Col. 4, Lines 6-28). **JUNKERT** is evidence that ordinary workers in the field of temperature measurement would have recognized the benefit of compensating for the ambient environmental temperature around the temperature detecting unit using a transducer or second thermopile in order to minimize errors associated with rapid ambient temperature changes (*e.g.,* see the Abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a calculating unit and another transducer or a second thermopile for compensating for the ambient environmental temperature around the temperature detecting unit with the device of **MACHLER** in order to minimize errors associated with rapid ambient temperature changes as taught by **JUNKERT**.

6. Claims 6-7, 9 and 11-14 are FINALLY rejected under 35 U.S.C. 103(a) as being unpatentable over GILLEN *et al.* (U. S. Patent No. 5,999,768 A, hereinafter **GILLEN**) in view of **JUNKERT**.

Gillen discloses or suggests an image forming apparatus as claimed by Applicant in **Claim 6,** the image forming apparatus comprising a fixing unit (fusing drum 96) that allows a toner image transferred on a transferring material to be fixed on the transferring material by heating the toner image under pressure (pressure drum 94), wherein the fixing unit comprises:

a fixing member (drum 96) that is brought into contact with the transferring material (media or substrate) so as to heat the transferring material;

a heating source (Col. 9, Lines 15-17) that heats the fixing member directly or indirectly;

a temperature detecting unit (infrared ray detecting thermopile 12; Col. 4, Lines 56-64) that detects a surface temperature of the fixing member based on an intensity of infrared rays from the fixing member;

a unit for determining a temperature for correction that determines a temperature (Col. 4, Lines 26-28) of a constituent member of the fixing unit opposed to the fixing member; and

a calculating unit (Figs. 3-4) that corrects the detected temperature obtained by the temperature detecting unit.

Regarding **Claim 7**: **Gillen** discloses the fixing member is an open-ended tube (fusing drum 9) or an endless belt.

Regarding **Claim 9**: **Gillen** discloses a face of the fixing member opposed to the temperature detecting unit is a curved surface concave toward a side of the temperature detecting unit (See Fig. 5).

Regarding **Claim 11**: **Gillen** discloses the unit 1 for determining a temperature for correction determines a temperature of a member (of the temperature detecting unit, itself, device 10) in the fixing unit opposed to the fixing member.

Further regarding **Claim 12**: **Gillen** discloses the temperature detecting unit includes a thermopile (12) that outputs a voltage (Fig. 3) corresponding to a temperature difference between a hot junction and a cold junction, and

the unit for determining a temperature for correction determines a temperature (Col. 8, Lines 10-23) of the cold junction of the thermopile.

Further regarding **Claim 13**: **Gillen** discloses the calculating unit corrects the detected temperature using a first temperature for correction (a calibration first operating point, e.g. 55 degrees C) determined by the unit for determining a temperature for correction at a predetermined point in time (time of calibration) before a point in time when the temperature detecting unit detects a temperature and a second temperature (the temperature of the heat sink) for correction determined by the unit for determining a temperature for correction at the point in time when the temperature detecting unit detects the temperature.

Further regarding **Claim 14**: **Gillen** discloses the first temperature for correction is determined when heating of the object member is started, since the calibration target is heated during calibration (Col. 6, Lines 9-20).

Gillen does not disclose the calculating unit using an environmental temperature around the temperature detecting unit and said temperature for correction for correcting the detected temperature ***as claimed by Applicant in Claim 6***, but instead tries to avoid temperature changes in the ambient environment around the temperature detecting unit by using a relatively large heat sink and maintaining the cold junctions of the thermopile at a constant temperature.

JUNKERT discloses a temperature determining device including a calculating unit (processor shown in Fig. 2) for processing the signals in order to compensate for an environmental (ambient) temperature around the temperature detecting unit (first thermopile device TP1; Col. 4, Lines 6-28). **JUNKERT** discloses an environmental temperature is detected by a transducer or a second thermopile TP2 (Col. 6, Lines 36-46).

JUNKERT discloses an alternate solution to the problem of compensating for ambient temperature transients, in contrast to the heat sink solution of the prior art, wherein the goal was maintaining the cold junctions of the thermopile at a constant temperature (Col. 1, Line 55 through Col. 2, Line 26).

JUNKERT is evidence that ordinary workers in the field of temperature measurement would have recognized the benefit of compensating for the ambient environmental temperature around the temperature detecting unit using a transducer or second thermopile in order to minimize errors associated with rapid ambient temperature changes (*e.g.*, see the Col. 2, Lines 16-26).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a calculating unit and a second thermopile for compensating for the ambient environmental temperature around the temperature detecting unit in the device of **Gillen** in order to compensate for cold junction temperature changes and minimize errors associated with rapid ambient temperature changes as taught by **JUNKERT**.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over GILLEN in view of **JUNKERT** as applied to Claims 1-7, 9 and 11-14 above, and further in view of OMATA et al. (U. S. Patent Application Pub. No. US 2002/0044801 A1, hereinafter OMATA)

GILLEN and JUNKERT, to summarize, discloses or suggests all the limitations as claimed by Applicant in Claim 8, as described above in Paragraph 6 as applied to Claims 1-7, 9 and 11-14.

GILLEN as described above, does not explicitly disclose the fixing member has a thickness of 0.02 mm to 0.6 mm as claimed by Applicant.

OMATA discloses

"[0057] In this embodiment, the fixing device 150 of a fixing belt type is employed. Because a fixing pin part of the belt type fixing device is greater than that of a fixing device of a fixing roller type, the belt type fixing device is superior in fixing performance. Further, as the fixing belt 51 having a thickness of 200 Tm or less is employed in this embodiment, the fixing belt 51 can be prepared for a fixing operation in a short heating-up time. Moreover, because the fixing belt 51 is formed from a heat-resisting resin film, the belt type fixing device can be low cost."

Moreover, it is well established that a thickness of 0.02 mm to 0.6 mm may be expressed equivalently as 20 Tm to 600 Tm by changing the units, as is well known in the art. As shown in the quotation above, OMATA teaches that a thickness of 200 Tm or less is employed in order to benefit from the fixing belt having the property that it "may be prepared for a fixing operation in a short heating-up time".

OMATA thus discloses that it is advantageous to provide a fixing member with a thickness of 0.02 mm to 0.6 mm in order to benefit from a short heating-up time of the fixing member.

OMATA is evidence that ordinary workers in the field of electrographic image reproduction would recognize the benefit of using a fixing member with a thickness of 0.02 mm to 0.6 mm as taught by OMATA for the undisclosed fixing member thickness of GILLEN in order to benefit from a short heating-up time of the fixing member.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a thickness of 0.02 mm to 0.6 mm as taught by OMATA for the undisclosed fixing member thickness of GILLEN in order to benefit from a short heating-up time of the fixing member as taught by OMATA.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over GILLEN in view of **JUNKERT** as applied to Claims 1-7, 9 and 11-14 above, and further in view of **TOMITA** (U. S. Patent Application Pub. No. US 2001/0051057 A1)

GILLEN and JUNKERT, to summarize, discloses or suggests all the limitations as claimed by Applicant in Claim 10, as described above in Paragraph 6 as applied to Claims 1-7, 9 and 11-14, further including the limitations wherein the fixing member has a face opposed to the temperature detecting unit, but GILLEN as described above, does not explicitly disclose the face opposed to the temperature detecting unit has a surface roughness Ra of not more than 0.2 Tm as claimed by Applicant.

TOMITA discloses (where Tm represents "micrometer"):

"[0079] In order to obtain color images having high gloss, the surface roughness of the fixing member is preferably as small as possible. As mentioned above, since the surface of toner images is embossed by the fixing member, it is the most preferable

that the surface of the fixing member has a ten-point mean roughness of 0 Tm. However, there is no fixing member having such a small surface roughness. Therefore, it is preferable to control the roughness of the surface of the fixing member so as to be as small as possible, i.e., not greater than 20 Tm in ten-point mean roughness Rz. Rz of the fixing member is preferably not greater than 10 Tm, more preferably not greater than 5 Tm, even more preferably not greater than 1 Tm, and most preferably not greater than 0.1 Tm."

TOMITA further discloses that it is advantageous to minimize surface roughness in order to benefit from color images having high gloss.

TOMITA is evidence that ordinary workers in the field of electrographic image reproduction would recognize the benefit of using a surface roughness Ra of not more than 0.2 Tm as taught by TOMITA for the undisclosed surface roughness of GILLEN in order to obtain color images having high gloss.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute surface roughness of not more than 0.2 Tm for the undisclosed surface roughness of GILLEN in order to obtain color images having high gloss as taught by TOMITA.

Allowable Subject Matter

9. Claims 15 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in a form PTO-892 and not mentioned above disclose related temperature measurement devices and methods and image fixing devices.

- WATANABE et al. (USPAT 5,056,929 A) also teaches that a temperature at each of the cold junctions of an infrared sensor (of the same type disclosed by MACHLER, using serially connected thermocouples, a thermopile) must be accurately measured at all times since this temperature is used as a reference level (Col. 1, Lines 49-65). WATANABE solves this problem by providing a thermopile 1 disposed on a thermistor chip 2 for compensating the temperature (Col. 3, Lines 5-9). WATANABE teaches it is advantageous to measure the temperature of the cold junctions 14b with the thermistor chip 2, in order to more accurately measure the temperature of the cold junctions 14b (Col. 2, Lines 54-58; Col. 4, Lines 1-32), which is determining an environmental temperature around the temperature detecting unit as claimed by Applicant.
- US 20030180062 A1 (Suzuki, Masashi) and JP 2004093651 A (Suzuki, Masashi), and also US 5287155 A (Arai; Atsushi et al.), disclose fixing devices with related temperature measuring and calculating devices and methods.
- US 5735604 A (Ewals; Gerardus L. G. et al.) discloses measuring temperatures of two plates, modeling heat flows and relating temperature changes measured in the plates to the temperature of an object 8 that could be a fixing member.
- US 3285069 A (MORRIS WEISS), US 2846882 A (GRAY WILLIAM T), US 6043493 A (Kim; In Sik et al.) disclose related temperature measuring devices and methods including using reflected radiation from second objects.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanley J. Pruchnic, Jr., whose telephone number is **(571) 272-2248**. The examiner can normally be reached on weekdays (Monday through Friday) from 7:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached at **(571) 272-2245**.

The ***Official FAX*** number for Technology Center 2800 is **(703) 872-9306** for ***all official communications***.

Any inquiry of a general nature or relating to the status of this application or proceeding may be directed to the official USPTO website at **http://www.uspto.gov/** or you may call the **USPTO Call Center** at **800-786-9199** or 703-308-4357. The Technology Center 2800 Customer Service FAX phone number is (703) 872-9317.

The cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources.

Private PAIR provides external customers Internet-based access to patent application status and history information as well as the ability to view the scanned images of each customer's own application file folder(s).

For inquiries relating to Patent e-business products and service applications, you may call the ***Patent Electronic Business Center (EBC)*** at **703-305-3028 or toll free at 866-217-9197** between the hours of **6 a.m. and midnight Monday through Friday EST,** or by e-mail at: **ebc@uspto.gov**. Additional information is available on the Patent EBC Web site at: **http://www.uspto.gov/ebc/index.html**.

SJP

Stanley J. Pruchnic, Jr.
2/11/05

GAIL VERBITSKY
PRIMARY EXAMINER